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SELF-ENCODING FIBER OPTIC SENSOR

Abstract of the Invention

B1
Self-encoding microspheres having distinct characteristic optical response signatures to specific target analytes may be mixed together while the ability is retained to identify the sensor type and location of each sensor in a random dispersion of large numbers of such sensors in a sensor array using an optically interrogatable encoding scheme, resulting in a microsphere-based analytic chemistry system. Individual microsphere sensors are disposed in microwells at a distal end of a fiber bundle and are optically coupled to discrete fibers or groups of fibers within the bundle to form an optical fiber bundle sensor. The identities of the individual sensors in the array are self-encoded by exposing the array to a reference analyte while illuminating the array with excitation light energy. A single sensor array may carry thousands of discrete sensing elements whose combined signal provides for substantial improvements in sensor detection limits, response times and signal-to-noise ratios.
